

# How Costly Is Carbon Abatement in the Residential Sector?

## Evidence from Energy Efficiency Obligations

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### Abstract

We evaluate the French Energy Savings Certificates program, under which energy retailers subsidize building retrofits to meet mandatory efficiency targets. Using sub-municipal electricity and gas data from 5 million housing units (2018–2021), we first estimate its impact on energy use and associated carbon emissions. We then develop a novel revealed-preference approach to measure the average carbon abatement cost, leveraging the tradability of certificates. Combining certificate prices with estimated energy savings and emissions factors yields a preferred estimate of €181 per ton of CO<sub>2</sub>e. Accounting for the pass-through of program costs into retail energy prices and the resulting reduction in energy demand lowers this to €54 per ton, indicating overall cost-effectiveness. This is despite official reports overstating realized energy savings by 69%.

**Keywords:** Energy efficiency, energy efficiency obligations, abatement cost of carbon

**JEL codes:** L78, Q48, Q58

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